In the Claims

1. (currently amended) A genetically engineered organism selected from the group consisting of bacteria and plants producing polyhydroxyalkanoate, the improvement comprising providing the ~~transgenic~~ organism ~~expressing~~ with a transgene encoding an enzyme having the catalytic activity of 3-hydroxyacyl-ACP thioesterase so that medium chain length PHA accumulates.

2. (original) The organism of claim 1 further comprising one or more transgenes encoding enzymes having the catalytic activity of acyl-CoA synthetase or acyl CoA transferase.

3. (original) The organism of claim 2 wherein the acyl-CoA synthetase is 3-hydroxyacyl-CoA synthetase.

4. (original) The organism of claim 2 wherein the acyl-CoA synthetase is *alkK*.

5. (currently amended) The organism of claim 2 or 3 further expressing a ~~PHA synthase~~ heterologous 3-hydroxyacyl-CoA synthetase activity.

6. (currently amended) The organism of claim 1 ~~or 5~~ further expressing a heterologous 3-hydroxyacyl-CoA synthetase activity.

7. (currently amended) The organism of claim 1 wherein the enzyme is modified to enhance expression in the genetically engineered organism.

8. (currently amended) The organism of claim ~~5~~ 1 expressing an enzyme selected from the group consisting of 3-hydroxyacyl-ACP thioesterase, medium chain length PHA synthase, and medium chain length 3-hydroxy fatty acid acyl CoA synthase, wherein the organism is a plant cell, plant tissue, or whole plant.

9. (original) The organism of claim 8 further expressing selectable marker genes, wherein the organism is a whole plant.

10. (currently amended) The organism of claim ~~5~~ 1 expressing an enzyme selected from the group consisting of 3-hydroxyacyl-ACP thioesterase, a PHA synthase that incorporates medium chain length hydroxy acids, and medium chain length 3-hydroxy fatty acid acyl CoA synthetase, wherein the organism is a bacteria.

11. (original) The organism of claim 8 wherein expression of the transgene is targeted to a tissue or organelle selected from the group consisting of seeds, leaf, plastids, and peroxisomes.

12. (original) The organism of claim 10 wherein the bacteria is *E. coli* and PHA accumulates within the bacteria.

13. (currently amended) A method of engineering a PHA biosynthetic pathway in a transgenic organism selected from the group consisting of bacteria and plants which produce polyhydroxyalkanoate, the improvement comprising providing the organism with a construct comprising a transgene encoding an enzyme having the catalytic activity of 3-hydroxyacyl-ACP thioesterase so that medium chain length PHA accumulates, ~~and making the organism~~.

14. (original) The method of claim 13 wherein the construct further comprises one or more transgenes encoding enzymes having the catalytic activity of acyl-CoA synthetase or acyl CoA transferase.

15. (currently amended) The method of claim 14 wherein the ~~enzymes have the catalytic activity of~~ construct comprises a transgene encoding a 3-hydroxy acyl-CoA synthetase.

16. (original) The method of claim 15 wherein the construct further comprises a transgene encoding a PHA synthase.

17. (original) The method of claim 16 wherein the organism is a plant.

18. (original) The method of claim 16 wherein the construct expresses an enzyme selected from the group consisting of 3-hydroxyacyl-ACP thioesterase, medium chain length PHA synthase, and medium chain length 3-hydroxy fatty acid acyl CoA synthase, wherein the organism is a plant cell, plant tissue, or whole plant.

19. (original) The method of claim 16 wherein the construct expresses an enzyme selected from the group consisting of 3-hydroxyacyl-ACP thioesterase, a PHA synthase that incorporates medium chain length hydroxy acids, and medium chain length 3-hydroxy fatty acid acyl CoA synthetase, wherein the organism is a bacteria.

20. (currently amended) A method of making ~~PHA~~ comprising growing a transgenic organism selected from the group consisting of bacteria and plants, the organism producing polyhydroxyalkanoate and expressing a transgene encoding an enzyme having the catalytic activity of 3-hydroxyacyl-ACP thioesterase.

21. (currently amended) The method of claim 20 wherein the organism further ~~comprising~~ comprises one or more transgenes encoding enzymes having the catalytic activity of acyl-CoA synthetase or acyl CoA transferase.

22. (original) The method of claim 21 wherein the acyl-CoA synthetase is 3-hydroxyacyl-CoA synthetase.

23. (original) The method of claim 21 wherein the organism further express a PHA synthase.

24. (original) The method of claim 22 wherein the organism further express a PHA synthase.

25. (original) The method of claim 24 wherein the organism expresses an enzyme selected from the group consisting of 3-hydroxyacyl-ACP thioesterase, medium chain length PHA synthase, and medium chain length 3-hydroxy fatty acid acyl CoA synthase, wherein the organism is a plant cell, plant tissue, or whole plant.

26. (original) The method of claim 24 wherein the organism expresses an enzyme selected from the group consisting of 3-hydroxyacyl-ACP thioesterase, a PHA synthase that incorporates medium chain length hydroxy acids, and medium chain length 3-hydroxy fatty acid acyl CoA synthetase, wherein the organism is a bacteria.

27. (cancel) A method of screening for enzymes encoding 3-hydroxy acyl ACP thioesterase activities comprising:

a) coexpressing an enzyme in a heterologous organism that expresses a PHA synthase and a 3-hydroxyacyl-CoA synthetase or a CoA transferase, and

b) growing the organism under appropriate conditions for the production of a PHA.

28. (cancel) A method for increasing the levels of C8 and C10 hydroxyacids or fatty acids of a plant oil composition comprising

a) expressing a transgene encoding an enzyme having the catalytic activity of 3-hydroxyacyl-ACP thioesterase, and

b) growing the plant under appropriate conditions for the production of the plant oil composition.

29. (cancel) The organism of claim 10 wherein the bacteria is *E. coli*, and

wherein 3-hydroxy acids are secreted into the culture medium.